IN THE CLAIMS

Please cancel claims 1-9 without prejudice.

Please add claims 10-29 as follows:

~~Patent Claims~~WHAT IS CLAIMED IS:

1-9. (Cancelled)

10. (New) A method for fabricating a reference layer for MRAM memory cells, comprising:

providing a layer system for the reference layer, the layer system having a first layer of a material having a first Curie temperature, wherein the first layer has a saturation field strength and can be permanently magnetized by an external magnetic field, and having a second layer of a material having a second Curie temperature, which is significantly lower than the first Curie temperature, wherein the second layer can be magnetized by antiferromagnetic coupling with the first layer;

generating an external magnetic field having a field strength;

cooling the layer system from a temperature above the first Curie temperature to below the first Curie temperature by action of the external magnetic field, the field strength of the external magnetic field being greater than the saturation field strength of the first layer, so that magnetization of the first layer is oriented by a second-order phase transition along the field direction of the external magnetic field; and

subsequently cooling the layer system below the second Curie temperature, magnetization of the second layer being oriented antiparallel with respect to the magnetization of the first layer on account of antiferromagnetic coupling between the first and second layers.

11. (New) The fabrication method of claim 10, further including setting the net magnetization of the layer system through the choice of a saturation flux, in particular of the layer cross section in each case of the first and second layers.

12. (New) The fabrication method of claim 10, further including setting the net magnetization of the layer system to zero by the respectively identical net magnetization of the first layer and the second layer.

13. (New) The fabrication of claim 10, further including setting the net magnetization of the layer system to be not equal to zero through selection of the second layer such that the layer cross section thereof is smaller than that of the first layer.

14. (New) The fabrication of claim 10, wherein subsequently cooling the layer system below the second Curie temperature further includes applying an external magnetic field, whose field direction is opposite to the magnetization direction of the first layer, upon passing through the second Curie temperature.

15. (New) The fabrication method of claim 10, wherein the layer system is further provided with a very thin intermediate coupling layer between the first and second layers, and wherein the antiferromagnetic coupling is imparted by the intermediate coupling layer.

16. (New) The fabrication method of claim 10, wherein the material of the first layer is chosen from a group comprising $(Co,Fe,Mn)_{80}(Si,B)_{20}$; $(Co,Fe)_{83}(Si,B)_{17}$; and $Tb_{20}Fe_{40}Co_{40}$, and the material of the second layer is chosen from the group comprising $(Co,Fe,Mo)_{73}(Si,B)_{27}$; $(Ni,Fe)_{78}(Si,B,C)_{22}$; and $Tb_{20}Fe_{80}$.

17. (New) The fabrication method of claim 15, wherein the material of the intermediate coupling layer is chosen from the group comprising ruthenium, copper, and gold.

18. (New) A MRAM memory cell having a reference layer comprising a layer system, the layer system further comprising:

a first layer of a material having a first Curie temperature and which can be permanently magnetized by an external magnetic field;

a second layer of a material having a second Curie temperature that is significantly lower than the first Curie temperature;

wherein magnetization of the second layer is oriented antiparallel with respect to the magnetization of the first layer on account of antiferromagnetic coupling between the first and second layers.

19. (New) The MRAM memory cell of claim 18, wherein an external magnetic field is applied to the layer system during formation such that the magnetization of the first layer is oriented by a second-order phase transition along the field direction of the external magnetic field.

20. (New) The MRAM memory cell of claim 18, wherein net magnetization of the layer system is set through the choice of a saturation flux, in particular of the layer cross section of the first and second layers.

21. (New) The MRAM memory cell of claim 18, wherein net magnetization of the layer system is set to zero by net magnetization of the first layer and second layer being identical.

22. (New) The MRAM memory cell of claim 18, wherein the second layer has a cross section that is equal to that of the first layer.

23. (New) The MRAM memory cell of claim 18, wherein the second layer has a cross section that is smaller than that of the first layer.

24. (New) The MRAM memory cell of claim 23, wherein net magnetization of the layer system is set to be not equal to zero through selection of the second layer such that the layer cross section thereof is smaller than that of the first layer.

25. (New) The MRAM memory cell of claim 18, further including a very thin intermediate coupling layer between the first and second layers.

26. (New) The MRAM memory cell of claim 25, wherein antiferromagnetic coupling of the first and second layers is imparted by the intermediate coupling layer.

27. (New) The MRAM memory cell of claim 18, wherein the antiferromagnetically coupled first and second layers form a artificial antiferromagnet.

28. (New) The MRAM cell of claim 18, wherein the material of the first layer is chosen from a group comprising $(Co,Fe,Mn)_{80}(Si,B)_{20}$; $(Co,Fe)_{83}(Si,B)_{17}$; and $Tb_{20}Fe_{40}Co_{40}$, and the material of the second layer is chosen from the group comprising $(Co,Fe,Mo)_{73}(Si,B)_{27}$; $(Ni,Fe)_{78}(Si,B,C)_{22}$; and $Tb_{20}Fe_{80}$.

29. (New) The MRAM cell of claim 25, wherein the material of the intermediate coupling layer is chosen from the group comprising ruthenium, copper, and gold.